UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _17 April 2009_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1 - 36_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1 - 36_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1.   Claims 1-10 and 12-36 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Joseph et al. (US 6,807,274), in view of Bala (US 6,798,876), and

U.S. Patent No. 6,480,598 (Reding) and further in view of Muller (US 5,561,711).

2.   In regards to claims 1 and 18, Joseph discloses an automated call routing

system (See Abstract and col. 2 lines 23-31) and computer readable medium,

comprising: an automated call routing component to route an incoming call to a member

(e.g., customer service representative) of an organization (e.g., call center) and provide

automated response (e.g., automated dialog) to one or more callers (e.g., customer)

(See Abstract and col. 2 lines 23-31); and a decision (e.g., routing decision) model

associated with the automated call routing component to mitigate transferring the calls

to an operator (e.g., live service representative) (See col. 2 lines 23-35). Joseph,

however, does not disclose a decision model, associated with the automated call

routing component, that employs probability to determine likelihood of success in

automatically routing the incoming call, the likelihood of success determined based in

part on a sequence of system actions from the incoming call as compared to system

actions of one or more previous calls, to mitigate transferring the calls to an operator.

Bala, however, does disclose a decision model (See Fig. 1 and statistical modeling

software/module 135), associated with the automated call routing component (See Fig.

1 and PBX/ACD 130), that employs probability to determine likelihood of success in

automatically routing the incoming call (See col. 3 lines 51-61), the likelihood of success

determined based on a sequence of system actions (e.g., list of question presented to

the caller prior to routing the call and/or prompting the caller to identify the product or

service that is needed) from the incoming call as compared to system actions of one or

more previous calls (for example, the system actions may be based on how

successfully a customer service representative handled a call in the past pertaining to

the selected product/service, or on what products/services were ordered by the

customer in the past (See Bala, col. 4 lines 30-65), to mitigate transferring the calls to

an operator (See Fig. 1 and attendant/customer service representative 180 and 181)

(See col. 2 lines 24-33, col. 2-3 lines 66-13, and col. 4 lines 26-33, of Bala). With

respect to the limitation "determine likelihood of success in providing the automated

response over automatically routing the incoming call to an operator" note that Reding

teaches a similar limitation, namely, when the calls are likely to fail when serviced by the

spoken dialog system and should be transferred to an operator (Figs. 1 – 5, 112 Voice

Function Node (VFN - i.e., "IVR"), Fig.7A, steps 702- 720, Fig. 7B, step 730 Call

Transferred to Manned Operator Workstation, Col. 6, lines 21 – 25, Col. 15, lines 49 –

51, i.e., the speech recognizer, and Col. 16, lines 28 – 32, i.e., to transfer the call to a

manned operator workstation for human operator assistance). It would have been

obvious to one of ordinary skill in the art to have incorporated such a limitation as taught

by Reding into the Joseph et al./Bala system in order to reduce operator time and

therefore reduce cost to the system.   However, Joseph, nor Bala nor Reding, disclose

the likelihood of success determined based in part on a sequence of system actions

from the incoming call as compared to system actions of one or more previous calls and

is re-determined for the incoming call after the occurrence of each system action from

the incoming call, to mitigate transferring the incoming call to an operator. Muller,

however, does disclose the likelihood of success determined based in part on a

sequence of system actions from the incoming call (e.g., incoming call 14, See Fig. 1)

as compared to system actions of one or more previous calls and is re-determined (e.g.,

updated) for the incoming call after the occurrence of each system action from the

incoming call, to mitigate transferring the incoming call to an operator (e.g., agent 30,

See Fig. 1) (See col. 2 lines 26-29, col. 3-4 lines 60-3, and col. 5 lines 9-30). Therefore,

it would have been obvious for one of ordinary skill in the art at the time of the invention

to incorporate these limitations within the system, as a way of providing a predictive

scheduling system and method that assigns telephone calls to telephone agents based

upon the likelihood of availability of the agents.

3.   In regards to claims 2 and 6, Joseph discloses the system, further comprising a

speech recognition component (e.g., Interactive Voice Response (IVR) system) for

communicating with the callers (See col. 2 lines 14-22).

4.   In regards to claim 3, Joseph discloses all of claim 3 limitations, except the

system, the decision model is trained from a data log that has recorded data of past

activities and interactions with the automated call routing component. Bala, however,

does disclose the decision model is trained from a data log that has recorded data of past activities and interactions with the automated call routing component (See col. 3 lines 24-29 and col. 4 lines 36-61).

5.   In regards to claim 4, Joseph discloses all of claim 4 limitations, except the system, the data log contains data relating to at least one of a Speaker Found, a Speaker Not Found, an OperatorRequest, a Help Request, a Hang Up, a Maximum number of Errors, a Not Ready indication, and an Undefined category. Bala, however, does disclose the data log contains data relating to at least one of a Speaker Found, a Speaker Not Found, an OperatorRequest, a Help Request, a Hang Up, a Maximum number of Errors, a Not Ready indication, and an Undefined category, or a combination thereof (See col. 3 lines 24-29 and col. 4 lines 40-48).

6.   In regards to claim 5, Joseph discloses the system, the decision model processes one or more dialog features including at least one of system and user actions, session summary feature, n-best recognitions features, and generalized temporal features, or a combination thereof (See Abstract and col. 2 lines 14-22).

7.   In regards to claim 7, Joseph discloses all of claim 7 limitations, except the system, the decision model employs a probability tree to determine the likelihood of success in automatically routing the incoming call given a sequence of system actions. Bala, however, does disclose the decision model employs a probability tree to determine the likelihood of success in automatically routing the incoming call given a sequence of system actions (See col. 2 lines 24-33, col. 2-3 lines 66-13, col. 3 lines 51-61, and col. 4 lines 26-33).

8.   In regards to claim 8, Joseph disclose all of claim 8 limitations, except the system, the decision model determines the likelihood of success based on p(SpeakFound|E), wherein SpeakFound is the member, E is observational evidence of system actions taken, and p is a probability, in part by counting a number of logged cases along an action sequence that resulted in success over a total number of cases along the sequences. Although, Bala, does not specifically disclose the decision model determines the likelihood of success based on p(SpeakFound|E), wherein SpeakFound is the member, E is observational evidence of system actions taken, and p is a probability..., Bala does disclose the decision model determines the likelihood of success based in part by counting a number of logged cases along an action sequence that resulted in success over a total number of cases along the sequences (See col. 3 lines 24-29, col. 4 lines 40-48, and col. 4 lines 58-61).

9.   In regards to claims 9 and 10, Joseph discloses the system, the decision model employs a dependency network that processes one or more categories of dialog (e.g., questions/queries) features as input variables (See col. 2-3 lines 44-5).

10.   In regards to claim 12, Joseph discloses the system, further comprising a component to increase an amount of data in order to boost a partial model for dialog turns over a marginal model (See col. 2 lines 23-31 and col. 3-4 lines 66-16).

11.   In regards to claims 13, 24, 32, and 33, Joseph discloses the system and method, the decision model includes at least one probabilistic model to perform at least one dynamic decision associated with costs and benefits of shifting a caller to human operator (See col. 1 lines 45-53).

12.   In regards to claims 14 and 35, Joseph discloses the system and method, the at

least one probabilistic model provides at least one prediction about an outcome to

enable administrators of automated call routing systems to specify preferences

regarding the transfer of callers to a human operator (See col. 3-4 lines 66-16).

13.   In regards to claims 15, 16, 21, and 34, Joseph discloses the system and

method, the preferences are represented as a tolerated threshold on failure as a

function of a current expected time that callers have to wait for a human operator, given

a current load on operators (See col. 3 lines 14-27 and col. 3 lines 39-57).

14.   In regards to claims 17 and 25, Joseph discloses the system and method, the

queue is optimized based on queue-theoretic formulation (See col. 4 lines 9-16).

15.   In regards to claim 19, Joseph discloses a system that facilitates call routing,

comprising: means for interacting with a caller (e.g., customer) making a call to a user

(e.g., customer service representative); means for automatically directing the caller to

the user; and means for performing a decision theoretic analysis before directing the

caller to the user (See Abstract and col. 2 lines 23-35), the decision-theoretic includes a

cost-benefit analysis weighing the benefits of transferring the caller to an operator (See

col. 1 lines 45-53). Joseph, however, does not disclose means for determining

probability of success in automatically directing the caller to the user, the probability of

success determined based in part on a sequence of system actions associated with the

call. Bala, however, does disclose means for determining probability of success in

automatically directing the caller (See Fig. 1 and caller 101) to the user (See Fig. 1 and

attendant/customer service representative 180 and 181), the probability of success

determined based in part on a sequence of system actions (e.g., list of question

presented to the caller prior to routing the call and/or prompting the caller to identify the

product or service that is needed) associated with the call (See col. 2 lines 24-33, col. 2-

3 lines 66-13, and col. 4 lines 26-33) and evaluating temporal features of past system

calls as well as evaluating outcome of the past system calls (for example, the system

actions may be based on how successfully a customer service representative handled a

call in the past pertaining to the selected product/service, or on what products/services

were ordered by the customer in the past, (See Bala, col. 4 lines 30-65). However,

Joseph, nor Bala disclose, the probability of success of the call is re-determined after

each system action. Muller, however, does disclose the probability of success of the

call (e.g., incoming call 14, See Fig. 1) is re-determined (e.g., updated) after each

system action (See col. 3-4 lines 60-3).

16.   In regards to claim 20, Joseph disclose a method for automatically routing calls,

comprising: determining a utility model for employment with a call routing system; and

automatically directing the call to at least one of the organization member (e.g.,

customer service representative) or an operator (See Abstract and col. 2 lines 23-35).

Joseph, however, does not disclose training the utility model from a log of past system

call activities; employing probability to determine likelihood of success in automatically

directing a call an organization member, the likelihood of success determined based in

part on a sequence of system actions associated with the call; and automatically

directing the call to at least one of the organization member or an operator, based in

part on the likelihood of success. Bala, however, does disclose training the utility model

from a log of past system call activities; employing probability to determine likelihood of

success in automatically directing a call an organization member, the likelihood of

success determined based in part on a sequence of system actions (e.g., list of

question presented to the caller prior to routing the call and/or prompting the caller to

identify the product or service that is needed) from the callas related to the utility model

(for example, the system actions may be based on how successfully a customer service

representative handled a call in the past pertaining to the selected product/service, or

on what products/services were ordered by the customer in the past, (See Bala, col. 4

lines 30-65). However, Joseph, nor Bala, disclose the likelihood of success determined

based in part on a sequence of system actions from the call and is re-determined after

the occurrence of each system action of the call; and automatically directing the call to

at least one of the organization member or an operator, based in part on the likelihood

of success. Muller, however, does disclose the likelihood of success determined based

in part on a sequence of system actions from the call (e.g., incoming call 14, See Fig. 1)

and is re-determined (e.g., updated) after the occurrence of each system action of the

call; and automatically directing the call to at least one of the organization member (e.g.,

agent 30, See Fig. 1) or an operator (e.g., agent 30, See Fig. 1), based in part on the

likelihood of success (See col. 2 lines 26-29, col. 3-4 lines 60-3, and col. 5 lines 9-30).

17.   In regards to claims 22, 23, and 26, Joseph discloses the method, further

comprising processing user frustrations (See col. 1 lines 55-61).

18.   In regards to claims 27-31, Joseph discloses all of claims 27-31 limitations,

except the specific formulas recited in claims 27-31. Joseph, however, does disclose

formulas (See col. 4 lines 8-16 and col. 4 lines 35-58) that produce the same results

that the present invention is attempting to obtain, in claims 27-31. Therefore, it would

have been obvious for one of ordinary skill in the art at the time of the invention to

incorporate the use of these formulas within the system, as a way of calculating the

"wait" time that a call is expected to be held in queue before being answered by a

customer service representative.

19.   In regards to claim 36, Joseph discloses the method, supporting an application

including at least one of touch-tone and speech recognition (See col. 2 lines 20-22).

20.   Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Joseph

et al (US 6,807, 274), in view of Bala (US 6,798,876), and Reding (US 6,480,598) in

view of Muller (US 5,561,711), and further in view of Chittineni (US 4,747,054).

21.   In regards to claim 11, Joseph, Bala, Reding and Muller disclose all of claim 11

limitations, except the system, the decision model employs a Markov Dependency

network. Chittineni, however, does disclose the use of a Markov Dependency network

(See col. 16 lines 16-25). Therefore, it would have been obvious for one of ordinary skill

in the art at the time of the invention to incorporate this decision model within the

system, as a way of modeling dependencies of errors of equations, such as the

equations/formulas used to calculate the "wait" time that a call is expected to be held in

queue before being answered by a customer service representative.

Response to Arguments

22.   Applicant's arguments with respect to claims 1-36 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bill Deane whose telephone number is (571) 272-7484. In addition, facsimile transmissions should be directed to Bill Deane at facsimile number (571) 273-8300.

05Jun2009

/William J Deane/

Primary Examiner, Art Unit 2614